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Dr. Joe Shirley, Jr.
PRESIDENT

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September 9, 2009

Andy Bain
Project Site Manager, Superfund Program
USEPA Region 9
75 Hawthorne Street, Mail Code: SFD 6-2
San Francisco, CA 94105

RE: Comments on Proposed Engineering Evaluation/Cost Analysis for Northeast Church Rock Site

Mr. Bain:

The following comments are submitted on behalf of the Navajo Nation, through the Navajo Nation Environmental Protection Agency and under the signature of the Executive Director of the Navajo Nation Environmental Protection Agency. An additional Exhibit A is enclosed which contains several comments specifically from the NNNEPA Superfund Program.

We wish to acknowledge and express our appreciation for the many efforts made by you and your staff to engage representatives of the Navajo Nation Environmental Protection Agency, the Navajo Nation Department of Justice and the Navajo Nation Council in both formal and informal consultations regarding uranium related matters in general and the Northeast Church Rock site (NECR) in particular. We are also especially appreciative that U.S. EPA has chosen a cleanup action level for NECR of background plus 1 piC/g.

Nevertheless, after having reviewed the Proposed Engineering Evaluation/Cost Analysis (EE/CA) and after having considered the U.S. EPA preferred remedy, 5A, calling for excavation of the NECR materials, disposal off-site of most of the contaminated materials at the UNC Superfund site and transport of some materials to an out of Indian Country location for reuse or final disposal, we are still of the opinion that the appropriate remedy is Alternative 2, total off-site removal.

Here is why.

First, it is our belief that the groundwater contamination issues at NECR have been inappropriately deferred. As we previously advised U.S. EPA, unless there is some basic groundwater work at the NECR site there is no basis for concluding that any of the action alternatives would accomplish compliance with chemical specific ARARs to protect water sources. In December 2008 we urged that a preliminary investigation should be implemented at the site in the first quarter of 2009 to inform the EE/CA's remediation/restoration options. We re-state that request.[1]

Second, the EE/CA's description of Alternative 2 lacks sufficient detail to allow for a critical review. We previously suggested to U.S. EPA that Alternative 2 should include more realistic and implementable off-site disposal locations, including existing uranium mill and mine waste disposal sites in the region (e.g., Ambrosia Lake, N.M., the G.E./Homestake facility near Milan, N.M., mined-out coal mines near Grants or White Mesa Mill at Blanding, Utah.) We were disappointed to find that the only mention in the EE/CA of alternative disposal sites is found in Section 3.6 dealing with the possible UNC Mill site option. The alternative disposal sites were dismissed by U.S. EPA because they posed "possible community acceptance issues, and differing logistical, administrative and technical challenges." We would appreciate it if U.S. EPA could tell us how the "community acceptance issues and differing logistical, administrative and technical challenges" associated with the alternative sites suggested by us compare with the community acceptance issues, logistical, administrative and technical challenges associated with the remedies proposed by U.S. EPA.

Additionally, we previously suggested that Alternative 2's impacts on the health of surrounding human and animal populations should be characterized. We were disappointed in seeing no such analysis in the EE/CA. Repeated references by U.S. EPA personnel during the recent Church Rock Chapter House public meeting comparing the Alternative 2 traffic miles to several trips back and forth to the moon do not constitute an adequate characterization of Alternative 2's impacts on the health of surrounding human and animal populations. We are mindful that there are risks associated with over-the-road truck traffic. Many Navajo citizens lost their lives in truck accidents associated with past uranium mining and processing. Nevertheless, we do not believe that a catchy comparison involving astronomical objects constitutes an adequate comparative risk analysis. In order for U.S. EPA to make a fully informed decision, relative risks should be adequately characterized and described.

Third, we were troubled by the U.S. EPA responses to questions raised by the public and the non-governmental organization representatives during the public meeting held at the Church Rock Chapter House. There were many questions raised regarding the technical feasibility and possible effectiveness of Alternative 5A, the U.S. EPA's preferred remedy. The consistent answer of U.S. EPA was that these matters will be addressed during the design phase of the project. That means even if U.S. EPA decides to hold another public meeting during the design phase of the project, the remedy will already have been selected; without the public, and, the Navajo Nation having answers to questions we deem particularly important, so important that they go to the heart of the matter regarding the effectiveness of Alternative 5A itself.

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1 See Exhibit B, December 12, 2008 letter from Navajo Nation to U.S. EPA, enclosed and incorporated by reference as part of these public comments.

Specifically, the Navajo Nation has serious questions regarding the potential effectiveness of Alternative 5A if U.S. EPA decides to dispose of approximately 861,000 cubic yards of radio-active contaminated soils on top of an existing unlined uranium mill tailings disposal cell. We raised this issue to U.S. EPA in December 2008. We indicated that such a disposal option will be unacceptable to the Navajo Nation. We believe that U.S. EPA, at the very least, should show loading calculations for purposes of estimating the effects of 1.25 million tons of mine waste on top of the existing tailings cap. We have seen no such calculations and we remain opposed to disposal of NECR mine waste on top of the existing tailings pile.

Fourth, continued references during the Church Rock Chapter House public meeting to the notion that remedies 2-5 are "equally" protective of human health and the environment are counter-intuitive and not supported by the EE/CA itself. The references are counter-intuitive because remedies 2-5 are quite different with different levels of environmental protection built in. One of the reasons that the Navajo Nation believes that Alternative 2 is the most protective remedy for Navajo people and Navajo lands is set forth in Table 5.1 of the EE/CA. It is noted that with reference to Alternative 2 "no further maintenance" is necessary. All other remedies require maintenance in perpetuity. Clearly, the long term effectiveness of the remedy is dependent on the long-term effectiveness of the maintenance. As we have expressed to the U.S. EPA on many occasions the concept of long term maintenance presents unique challenges in Navajo Indian Country.

Fifth, we disagree with what appears to be a strong implication that Alternative 2 will not be selected because it is too costly. As we have expressed to you before in words similar to those you heard from Congressman Henry Waxman in 2007, uranium contamination in Navajo Indian Country is a uniquely American tragedy caused, in large part by failures in governmental oversight, regulation and control. The Navajo people have in the past, and continue to this day sacrificing disproportionately to the rest of the American population regarding the production of a nuclear arsenal that contributed greatly to the United State's victory in the cold war.

Thank you for the opportunity to provide these written comments on the Proposed EE/CA and we look forward to our continuing work with the United States Environmental Protection Agency in trying to address the unfortunate, unjust and disproportionately distributed legacy of last century's nuclear arms race.

Sincerely,

/S/
Stephen B. Etsitty, Executive Director
Navajo Nation Environmental Protection Agency

Enclosures

xc: David Taylor, Navajo Nation DOJ

NNEPA Superfund Program Comments to May 30, 2009 Engineering Evaluation/Cost Analysis, Northeast Church Rock (NECR) Mine Site, Gallup, NM

The following comments submitted are in relation to our December 12, 2008 letter addressed to Ms. Elizabeth Adams, USEPA Superfund, Associate Director.

1. We previously raised an issue regarding the use of a "health-based action level that is more than two times greater than local background of 1 pCi/g and carries a 1-in-30,000 ($3x10^{-4}$) risk of cancer". In the Final EE/CA, the risk level is changed to a 1-in-20,000 ($2x10^{-4}$), which is less protective and the action level still remains the same. Please explain this discrepancy.

2. As noted, a key assumption of the EE/CA is that site-wide remediation to the radium action level of 2.24 pCi/g will address all uranium levels. The Final EE/CA states (p. viii) that using the Ra-226 RAO will address Uranium to below its PRG and that this will be confirmed with sampling. Confirmation sampling should not only be for Uranium, but all the metals included as COC's: Arsenic, Molybdenum, Selenium and Vanadium.

3. Regarding Waste Volume Estimates, there is insufficient data to confidently define the depth of contamination, please state when additional characterization will be planned and when a more accurate estimate of waste volumes will be obtained.

4. Please add a column to Table 5.4, NECR Action Levels that shows the background (or, levels obtained from samples taken at "non-impacted" sites pursuant to the MARSSIM strategy).

5. Contingency Plan. There needs to be consideration of contingency plans in case the EE/CA action chosen by the USEPA needs to be reevaluated. Based on the fact that there is very limited data to make concise volume estimates, the waste could be twice the amount used in the Final EE/CA's assumptions. Once USEPA issues a decision document, will USEPA be willing to re-open up its decision document? Contingencies need to be included in the response to comments.

Exhibit B

NAVAJO NATION DEPARTMENT OF JUSTICE
OFFICE OF THE ATTORNEY GENERAL

LOUIS DENETSOSIE
ATTORNEY GENERAL

HARRISON TSOSIE
DEPUTY ATTORNEY GENERAL

December 12, 2008

PRIVILEGED AND CONFIDENTIAL

Ms. Elizabeth Adams
United States Environmental Protection Agency, Region IX
75 Hawthorne St.
Mail Code SFD-7
San Francisco, CA 94105

Re: Draft Engineering Evaluation/Cost Analysis, Northeast Church Rock Site

Dear Ms. Adams:

This letter is a follow-up to our December 5, 2008 government-to-government consultation regarding the Engineering Evaluation/Cost Analysis ("EE/CA")[1] for the Northeast Church Rock mine site near Gallup, New Mexico ("NECR"). The following reflects decisions reached during the government-to-government consultation, as well as the Navajo Nation's comments on various components of the EE/CA.

I. Clarification of Removal Action Alternative No. 5

Removal Action Alternative No. 5 (including options "A" and "B" within Alternative 5) currently proposes consolidating all NECR mine waste at the UNC mill facility. Alternative 5 will be revised to propose consolidation of all NECR mine waste on "a nearby off-site facility" not necessarily limited to the UNC mill site. The EE/CA will note that the UNC mill site is mentioned merely as an example of one such facility, and to provide a basis for the EE/CA's required cost analysis.

II. Proposed New EE/CA Section Regarding the US EPA's Trust Responsibility

During the government-to-government consultation, we discussed including a new section early in the EE/CA to acknowledge the federal government's trust responsibility to the Navajo Nation and its impact on the NECR EE/CA. We agreed with your proposal to include the following language in a new Section 1.2:

[1] Please note that all page and table references are to the EE/CA unless otherwise noted.

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"The federal government, including the EPA, bears a unique trust responsibility to Indian Tribes, including the Navajo Nation. The EPA acknowledges this trust responsibility in its Policy for the Administration of Environmental Programs on Indian Reservations, which states: "In keeping with [the] trust responsibility, the Agency will endeavor to protect the environmental interests of Indian Tribes when carrying out its responsibilities that may affect the reservations."[2]

"The EPA's Indian Policy also states: "In carrying out our responsibilities on Indian Reservations, the fundamental objective of the Environmental Protection Agency is to protect human health and the environment. The keynote of this effort will be to give special consideration to Tribal interests in making Agency policy, and to insure the close involvement of Tribal Governments in making decisions and managing environmental programs affecting reservation lands." *Id.* at 1.

"The EPA has consulted the Navajo Nation throughout the development of the EE/CA. Remediation of uranium contamination on Navajo land presents a longstanding problem, particularly as concerns the NECR mine site. The Navajo Nation has raised objections to removal alternatives that retain waste in or near Indian Country (as defined by 18 U.S.C. § 1151), and has articulated several cultural, historical, and legal concerns in support of this position. Among these are the Navajo people's unique reliance on the land for religious purposes and many other aspects of their lives. In accordance with its trust responsibility and the Indian Policy, the EPA has given special consideration to the Navajo Nation's interests during preparation of the EE/CA."

III. Navajo Nation's Comments on the EE/CA

A. General Comments on the EE/CA

- **Project Action Level:** The proposed project action level of 2.24 picoCuries per gram ("pCi/g") for radium-226 compares favorably with applicable remediation standards for analogous materials; to wit, USEPA's off-site clean-up standard for radium in soils at uranium mill tailings facilities (*i.e.*, 5 pCi/g in the first 15 centimeters of soils and 15 pCi/g in the second 15 cm. See 40 C.F.R. §§ 192.02, 192.04). However, the proposed "health-based" action level is more than two times greater than local background of 1 pCi/g and carries a 1-in-30,000 lifetime risk of cancer (p. viii), which is a risk level that resides at the lower end of the risk range that USEPA usually regulates for human carcinogens (*i.e.*, 1 in 10,000 to 1 in 1,000,000). The text does not note, but should, that radium is a Class A human carcinogen that is associated with bone, liver, and breast cancers.[3] Some discussion should be devoted to any post-remediation/restoration uses of the mine site that may be limited or restricted by residual radium levels in soils.

- **Soil Contaminant Concentrations:** References (*see, e.g.*, pp. 2, 8, 10) are made repeatedly to soil contaminant concentrations contained in the Final Removal Site Evaluation ("RSE") Report (MWH, October 2007). Some soil data for radium, uranium and arsenic are provided (pp. ix, 7, 8), but these data (expressed as averages and ranges)

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[2] Mr. Minor suggested including a citation to the EPA's Indian Policy in the appropriate location in the EE/CA. EPA Policy for the Administration of Environmental Programs on Indian Reservations at 3, *available at* http://www.epa.gov/tribal/pdf/ reaffirmation-indian-policy.pdf.

[3] For more information on radium, see http://www.atsdr.cdc.gov/tfacts144.html.

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are insufficient to describe the vertical extent of contamination. We suggest that applicable data tables from the Final RSE be incorporated in the EE/CA, both to increase confidence in the document's preliminary analyses and to facilitate public review and comment. Furthermore, these data should be keyed to locations and depths because they are integral to the waste-volume estimates that are the underpinning for the cost estimates contained in Table 5.2.

- **Uranium in Soils at NECR Mine Site:** A key assumption of the EE/CA is that site-wide remediation to the radium action level of 2.24 pCi/g will address all uranium levels, even those at the upper end of the range reported on page 7 (*i.e.*, 3,970 milligrams per kilogram dry weight ["mg/kg"], or parts per million ["ppm"]). A technical basis for this assumption should be provided in light of the high levels of uranium present on the site. For instance, the Wetmore Plots show at least five soil samples having U concentrations exceeding 1,000 mg/kg, which would suggest that economic uranium ore still exists at the site. Furthermore, the Wetmore Plots show perhaps 30 to 40 samples exceeding the 200 mg/kg "screening" level for uranium used by United Nuclear Corp.'s consultants, MWH, in 2007.[4] MWH also calculated an average uranium concentration for site soils of nearly 80 ppm, as shown in the table in footnote 3 below; this average is 11 to 266 times the range of uranium measured in areas not impacted by uranium mining, and is 5 times greater than the USEPA residential "preliminary remediation goal" ("PRG") for uranium. The Navajo Nation and affected communities must have assurances that these high levels of uranium will be addressed concomitantly with radium and other hazardous substances if the 2.24-pC/g radium action level is adopted.

- **Waste Volume Estimates:**

  The document's estimate of the total volume of wastes that will be removed — 871,100 cubic yards — is based largely on the area believed to have radium-226 concentrations >2.24 pCi/g, and to a lesser extent, on a limited number of soil/waste samples from the "high activity" areas in and around Ponds 1, 2 and 3. The draft admits that "there is insufficient data to confidently define the depth of contamination" (p. 13), but states further that the volume estimate is "conservative" without saying why. Table 3.1, which purports to list "removal action volumes" (p. 19), was missing from the draft submitted to the Navajo Nation and should be included in the final draft for public comment. Tables showing contaminant concentrations and their depths, along with the Wetmore Plots showing the distribution of soil concentrations for U and Ra, should be included in the public comment draft. The EE/CA should make clear that the volume of waste actually at the site may deviate substantially from the figures presented in the

[4] MWH. Removal Site Evaluation Investigation Results: Northeast Church Rock Mine Site, United Nuclear Corp. Slide show prepared for Working Group Meeting, May 22, 2007; slide 14 of 20. The data table incorporated in Slide 14 is pasted below:

	Ra-226	As	Mo	Se	U	V
	pCi/g	Mg/kg				
Screen	2.24	3.7	5,100	5,100	200	1,000
Qty	263	229	229	229	229	229
Avg	30.6	4.2	3.8	9.5	79.7	40.2
Max	875.0	14.9	214	159	3970	502

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EE/CA. If additional on-site characterization is not planned until after issuance of a final EE/CA, USEPA should specify when such additional characterization will be done and when a more accurate and reliable estimate of waste volumes will be obtained and made public. The EE/CA should state that the volume estimates were prepared in consultation with G.E. and if those estimates prove low the responsible parties will still be required to perform the removal and restoration consistent with the standards set forth in the EE/CA.

- **Removal Action Levels, PTW Levels, ARARs:** The text of the EE/CA would benefit from a readable table that describes each of the action levels, PTW levels, and ARARs that will be used in the proposed action. A column of PRGs for both industrial and residential sites and a column showing "background" (or, levels obtained from samples taken at "non-impacted" sites pursuant to the MARSSIM[5] strategy) would facilitate comparison of selected action levels.

  Additionally, the EE/CA should include as an **ARAR** the definition of "trespass" as contained in the Navajo Nation Civil Trespass Act, 21 N.N.C. §2203(O) as set forth below.
  "O. "Trespass" means the unauthorized interest in, possession of, holding over upon, entry upon, the accidental spilling or intentional dumping of petroleum products or any hazardous waste, hazardous substances, or hazardous materials as defined by Navajo or federal law on, or other use of (including without limitation the disposal of industrial wastes, mine wastes, tailings, and other contamination on and/or the failure to remove such materials from) Navajo Nation Lands."

- **Groundwater Contamination Issues Inappropriately Deferred:** The EE/CA states that "detailed groundwater characterization has not been performed" and that "no conclusions have been reached" about the existence of or potential for groundwater contamination at the mine site (p. 10). Given these admissions, the EE/CA has no basis for concluding that any of the action alternatives would accomplish compliance with "chemical-specific ARARs to protect water resources" (p. 52). Despite the lack of a groundwater investigation at the site, some evidence suggests that groundwater has been recharged to the alluvium from historic mine-water flows, from leakage from mine-water ponds, and from percolation of runoff from the highlands to the south of the site. Some of this groundwater may be "perched" and some may have infiltrated to the first water-bearing bedrock aquifer, the Upper Gallup Sandstone (from which groundwater was encountered at about 400 feet below land surface in the NECR-1 shaft) (see p. 3).

  Furthermore, recent field research conducted for the Church Rock Uranium Monitoring Project (CRUMP) and DiNEH Project suggests that groundwater contamination is possible from migration of soluble uranium through the soil column. First, researchers found increasing concentrations of uranium in soils up to 3 feet deep at sample locations between the NECR Mine site and the Nez home south of Red Water Pond

[5] MARSSIM stands for Multi-Agency Radiation Survey & Site Investigation Manual. See http://www.epa.gov/rpdweb00/marssim/.

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Road. The table below showing this finding is taken from the researchers' presentation at the annual meeting of the American Public Health Association in November 2007.[6]

Sampling Sites	# Samples	Range U in Soils (ppm)	Median (ppm)
Sites NOT or POSSIBLY impacted by uranium mining	68	0.3-2.61	0.74
Red Water Pond Road IMPACTED sites (soil depths, 2"-12")	38	0.3-88.7	16.8
Red Water Pond Road IMPACTED sites (soil depths, 18"-36")	12	0.48-72.0	31.8
COMPARISON TO REGULATORY LEVELS AND BACKGROUND			
% Samples > USEPA PRG for U in residential areas (16 ppm)			**56%**
% Samples > maximum local background (2.61 ppm)			**74%**

Second, surface sediment transport and solubility studies conducted by Dr. Jamie deLemos and colleagues in 2006-2007 showed that uranium in its hexavalent form is highly soluble and mobile in soil columns.[7] Bench-scale tests conducted by Dr. deLemos showed uranium concentrations ranging up to 4 milligrams per liter (mg/l) (or, more than 130 times the federal drinking water standard) in distilled water exposed to soils containing up to 100 mg/kg (ppm) uranium. The implications of these findings are that groundwater under NECR may already have been impacted by infiltration of mine water and runoff, and that removal of waste materials could expose contaminated soils to further oxidation by air and water, potentially leading to additional generation of contaminated leachate. A preliminary groundwater investigation should be implemented at the site in the first quarter of 2009 to inform the EE/CA's remediation/restoration options.

- **Alternative 3, Capping, is Not Acceptable:** Alternative 3, capping of wastes on the NECR Mine Site, in not acceptable technically because it does not include placement of a bottom liner to protect groundwater resources. The EE/CA uses the lack of site-specific groundwater data to justify the absence of a liner in this option (see p. 39). But the absence of evidence is not evidence of absence. The fact that no groundwater data now exists does not justify a remediation/restoration option that does not use state-of-the-art waste management techniques to protect human health and the environment. Capping alone would not be an acceptable waste management method for any other waste stream. The wastes at the NECR Mine Site are radioactive by their radium content and toxic by their uranium and arsenic concentrations alone. Their permanent

[6] Shuey C, deLemos JL, George CC. Uranium Mining and Community Exposures on the Navajo Nation. Presentation at Annual Meeting of the American Public Health Association (Washington, DC), Nov. 7, 2007.

[7] deLemos JL, Bostick BC, Quicksall AN, Landis JD, George CC, Slagowski NL, Rock T, Brugge D, Lewis J, Durant JL. Rapid Dissolution of Soluble Uranyl Phases in Arid, Mine-Impacted Catchments near Church Rock, NM. Environmental Science and Technology, 42:11, 3951-3957 (2008).

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disposition should be consistent with these hazards.

Accordingly, the EE/CA's analysis of Alternative 3 should be modified. The analysis of Alternative 3 currently states that "[a] liner is not used in Alternative 3, as no data is available to indicate a pathway for contaminated mine wastes to the groundwater" (p. 39). The statement that "no data is available" is incorrect and could be read as an affirmative acknowledgement that no pathway exists, when in fact the above-described research strongly suggests that multiple pathways do indeed exist. The statement should be replaced with the following: "Because studies suggest several likely pathways for contaminated mine wastes to the groundwater at the disposal site, Alternative 3 will not be protective of human health and the environment."

- **Alternative 2, Removal and Remote Disposal, Should Be Described in Greater Detail:** A lack of detail thwarts a critical review of Alternative 2, removal of the mine waste and disposal at a remote site (*see* pp. 20-22, 36-38, 51, 55). The only remote site suggested is one located in Idaho more than 1,500 miles away. Because the cost differential is an order of magnitude greater ($291 million v. $30 million for Alternative 4), and because the length of time to complete remediation/restoration is 2 to 3 times longer (9 years for Alternative 2 v. 3 years for Alternative 3 and 4 years for Alternatives 4 and 5), Alternative 2 appears unacceptable on its face. The EE/CA's description of Alternative 2 should include more realistic and implementable off-site disposal locations, including existing uranium mill and mine waste disposal sites in the region (*e.g.*, Ambrosia Lake, N.M., the G.E./Homsestake facility near Milan, N.M., mined-out coal mines near Grants or White Mesa Mill at Blanding, Utah). The number of truck loads should be estimated and possible transportation routes disclosed. Any additional administrative requirements associated with this Alternative should be discussed, especially whether a NEPA process would be required to assess transportation alternatives and impacts. Finally, Alternative 2's impacts on the health of surrounding human and animal populations should be characterized.

- **Description of the At-risk Local Population:** The EE/CA does not provide a cogent description of the residential character of the area affected by remediation/restoration (see pp. 4, 10-11, 20). As the Region 9 staff knows, people live in close proximity to the NECR Mine Site (affected by all alternatives) and the UNC tailings disposal facility in Section 2 of T16N, R16W and Section 36 of T17N, R16W that would be affected by Alternative 5. Based on surveys conducted by CRUMP and the DiNEH Project since 2003, and on door-to-door contact with residents, 14 families reside on Red Water Pond Road north of the NECR site, about 25 families reside along Pipeline Road northeast of the UNC tailings facility, and about 12 families reside along State Rt. 566 south of the UNC mill site. At an average of four persons per Navajo family, this represents a population of at least 200 people who live continuously within 1.5 miles of the NECR mine in the Navajo chapters of Coyote Canyon, Nahodishgish/Standing Rock, and Pinedale. Furthermore, these residents have communicated their concerns about the NECR Mine Site in writing to USEPA on several occasions,[8] and have had numerous

[8] *See, e.g.*, Resolution of Red Water Pond Road and Pipeline Canyon Road Residents, August 11, 2006, transmitted to USEPA Region IX in letter dated September 12, 2006 from Bernice Norton and Chris Shuey, Church Rock Uranium Monitoring Project, to Andrew Bain, USEPA; letter to Norton and Shuey from Bain, November 3, 2006; and letter from Church Rock Mine Area Association to S. Etsitty and H. Allen, April 12, 2007.

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community meetings and briefings attended by USEPA personnel. While the EE/CA is a regulatory document required by provisions of CERCLA to estimate the cost of a removal action, it should clearly convey that the proposed remediation/restoration is intended, in large part, to mitigate, if not eliminate, environmental exposures to people who live, and have lived for parts of four decades, next to NECR.

- **Replacement of Homes in the Step-out Area to Safe Locations:** The EE/CA should include as a sub-alternative the replacement of Navajo residences now located in the "Step-out" area north of the northernmost waste dump on the NECR Mine Site and on both sides of Red Water Pond Road. As discussed on December 5, preliminary results of logistic regression modeling of health-survey responses and geospatial data from the DiNEH Project health study show a significant relationship between two environmental factors (*i.e.*, an individual's contact with uranium wastes and the number of abandoned mines within four miles of his or her home) and the development of kidney disease and diabetes. These results will be published in a peer-reviewed journal sometime in the first half of 2009 and will establish a documented health risk to people who live in mining-impacted communities. At least six homes are now located in the Step-out area, which was subject to the time-critical emergency removal of radium-contaminated soils in Spring 2007. Residents of these homes, who were exposed to contaminated soils for possibly 35 years, will be exposed to dusts, construction debris, vehicle emissions, and other remediation/restoration activities over at least a three-year period, and possibly longer if Alternative 2 is adopted. Suitable home sites are located at the west end of the valley about 1 mile northwest of the NECR Mine Site, and sampling at those sites revealed only background levels of radium and uranium. Protection of public health during and after remediation/restoration of NECR merits replacement of homes now located on Red Water Pond Road.

- **Realignment of State Rt. 566, Pipeline Road, and Red Water Pond Road:** Alternative 5 will necessitate the realignment of Pipeline Road to (1) facilitate access to the tailings area for construction of the mine-waste repository and transportation of mine wastes, and (2) eliminate local public access to a contaminated area. Pipeline Road through the UNC tailings area (Section 2 and Section 36) is perpetually in poor condition, is subject to periodic flooding, and requires local residents to traverse the bottom of the Pipeline Arroyo. A new alignment could connect with State Rt. 566 at the top of the hill east of the NECR Mine Site. A permanent, all-weather paved road and bridge over the Pipeline Arroyo would facilitate residents' access to their homes along Pipeline Road northeast of the UNC tailings area while reducing exposures to environmental contaminants. Such a plan would also allow for the improvement of Red Water Pond Road in the valley between the NECR Mine Site and the Kerr-McGee/Quivira Church Rock I Mine Site. The EE/CA should include road improvements and realignments as necessary sub-alternatives for facilitating remediation/restoration and protecting public health.

- **Revegetation Effectiveness:** Each EE/CA alternative involves revegetation of remediated areas and-or application of growth-promoting soils on top of the caps. Establishing and maintaining growth of native plants and grasses in an arid environment is difficult and has met with limited success at other sites. For example, revegetation at the Jackpile Mine on Laguna Pueblo has been particularly problematic. The EE/CA should contain a more expansive discussion of the challenges of revegetation (*see, e.g.*, Sec. 2.3.2.3 at 17), along with analogous examples. Cost estimates may need to be revised to include a long-term source of water to support reestablishment of vegetation.

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B. **Specific Comments on the EE/CA**

- **"Mine permit," "mining lease," and other similar terms (pp. vii, 2, 5):** Various terms are used to suggest that the main portion of NECR on Section 35 (T17N, R16W) was licensed and-or permitted by various federal, state, or tribal agencies. The only documented "permitting" that we are aware of for the site is the U.S. Nuclear Regulatory Commission's (NRC) license (SUA-1475) for management of uranium mill tailings imported to the mine site from the UNC mill in Section 2 (T16N, R16W) for the purpose of backfilling of mine slopes in the last 1970s and early 1980s. We do not believe that the mining operation itself was ever permitted or licensed by any federal, state, or tribal agency. However, USEPA may know of such licenses and-or permits. A table should be inserted early in the document that lists all such licenses and-or permits, their purposes, and what materials or lands (or both) they covered. The text should also explain how UNC was (or was not) authorized to use lands on Section 3 (T16N, R16W, south of the main Section 35 site) and Section 34 (T17W, R16W, abutting the west side of the main site) for mining-related activities, including waste management and disposal.

- **Figure 1.1, p. 2:** The eastern extent of the Kerr-McGee/Quivira Mining Co. Church Rock I and IE Mine should be shown on this map. It is the location of the IE headframe located about 0.6 miles north of the Navajo Reservation boundary on the west side of Pipeline Road.

- **Sec. 1.2.1 (p. 2):** The correct spelling of "coffonite" in the second paragraph is "coffinite," and its chemical formula is U(SiO4)1-x(OH)4x.

- **Sec. 1.2.2. – Site Geology and Hydrology (p. 3):** The Dakota Formation is the lowermost Cretaceous-age formation, not Jurassic.

- **Sec. 1.2.4. – Surrounding Land Use and Populations (p. 4):** The reference here to Church Rock's population being 1,100 is not accurate. The 2000 Census population for Church Rock Chapter of the Navajo Nation was 2,802. This information can be obtained from http://churchrock.nndes.org/ (click on "Chapter Data" in the window on the left side of the page). Additional information can be obtained in a similar manner by visiting the websites for each of the chapters affected by the NECR Mine Site and the remediation/restoration alternatives discussed in the EE/CA (see http://community.enavajo.org/chapters.do#Eastern). Alternatively, USEPA should consult data in "Chapter Images" (2003), the official Census publication of the Navajo Nation Division of Community Development that contains profiles and demographic information for all 110 Navajo chapters.

- **Sec. 2.2. – Principal Threat Waste Level (p. 14):** To limit confusion, the EE/CA should avoid using the term "source materials," even in a generic sense, to describe the wastes that contain radium, uranium, and other contaminants. In this context, "waste materials" or "mine wastes" are superior terms. In the same section, "average" concentrations of Ra and U are cited, yet the data in the Wetmore Plots clearly show a non-normal distribution of the sample data. Median values may more accurately describe the mid-point in each data set.

- **Sec. 2.3.2.1 (p. 16):** The correct name of OSHA is the Occupational Safety and Health Administration, not "Agency."

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- **Sec. 3.1 (pp. 19-20):** Several documents will be generated during the "planning stage" discussed at the top of page 20. A timeline graphic would be useful in showing the steps and timeframes of the remediation/restoration process following finalization of the EE/CA.

- **Sec. 3.5.3 (p. 27):** The "best location" for the Alternative 4 repository is stated to be "contained in a valley" located at the south side of the Section 35-Section 3 mine site. If this is in fact the preferred location, a more detailed site suitability analysis is warranted, given what we learned from the factors that led to the catastrophic failure of the UNC tailings dam on July 16, 1979. In the tailings dam case, the dam was partially constructed over alluvium and partially over bedrock, resulting in differential settlement. Overloading of the South Cell with tailings and tailing effluent in excess of the dam's freeboard limit further contributed to the failure. While the mine waste repository on Section 35 would not be exposed to any fluid, its location on a potentially unstable geologic site deserves a heightened level of analysis. The Navajo Nation's opposition to this Alternative should also be noted.

- **Sec. 3.6. – Alternative 5 (pp. 29-31):** The fact that the existing tailings impoundment is unlined should be acknowledged in this section. Furthermore, the analysis of Alternative 5 needs a figure or figures that show alternative locations for the mine-waste disposal cell. One EE/CA listed location (unacceptable to the Navajo Nation) is on top of the existing tailings impoundment in roughly the location of what once was the Central Cell. A cross-section should depict the existing tailings profile and the mine-waste repository (liner, waste, cap, etc.). Loading calculations should be made to estimate the effects of a 1.25-million-ton waste cell on top of the existing tailings cap. Another figure should show the possible location of a new mine-waste cell. The only space to put such a cell is north of the former North Cell of the tailings impoundment on land that is now located in Section 36 where dozens of monitor wells and pump-back wells are located for the tailings groundwater remediation program.

- **Sec. 4.2. – Logistical Issues (p. 34):** Given the need for environmental monitoring during remediation/restoration (including an on-site laboratory [see, p. 38]) and for long-term maintenance and surveillance of NECR following remediation/restoration for a 30-year period, a remediation/restoration assessment and compliance facility and education center should be constructed near the site along Red Water Pond Road. This facility could serve multiple purposes, including as an administrative center during the construction phase, as a central location for remediation/restoration employment opportunities, and an educational facility for post-remediation/restoration monitoring and maintenance activities. The Navajo Nation could use the facility to house some of its technical staff and offer parts of the facility to local schools and colleges for environmental sciences instruction and job training. Remediation/restoration cost estimates should include funds needed to construct and operate such a facility. Remediation/restoration of the highest priority AUM in Navajo Country necessitates leaving the affected community and the Navajo Nation with a useful asset for current and future generations.

- **Sec. 4.5.2.3 (p. 42):** Appendix C, a September 8, 2008, letter from the Navajo Nation Department of Justice to USEPA was missing from the copy of the EE/CA submitted to the Navajo Nation.

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- **Sec. 4.7.1.3 (p. 48):** Several questions should be answered in subsection 4.7.1.3. If the mine-waste repository is constructed adjacent to, but not on top of, the tailings impoundment, would DOE assume ownership of the mine wastes under its NRC license for the tailings facility? Would DOE be responsible for long-term maintenance and surveillance of the mine-waste repository? If not, which agency would have such responsibility?

- **Sec. 5.1.2.1 (p. 52):** The EE/CA should exchange the term "source material" for "mine wastes" or some other suitable term to avoid confusion with the AEA definition of source material.

- **Sec. 5.2.2 (p. 54):** The NRC issued a "license" for the UNC tailings facility, not a "permit." Also, the statement in the third bullet that a new repository "separate from the existing [tailings] cells will not require as much administrative coordination with NRC or DOE" should be substantiated. Currently, the NRC license for the UNC tailings facility encompasses all of Sections 2 and 36, including possible locations for a separate mine-waste repository. Accordingly, GE/UNC would have to apply for a license amendment for either scenario.

- **Sec. 5.2.4 (p. 54):** Since the area impacted by NECR under the remediation/restoration plan spans parts of four Navajo Chapters, community "acceptance" will be a function of how well local residents and elected officials in each of the Chapters are informed and invited to participate in administrative processes associated with approval of the EE/CA. Establishing a formal community advisory committee that meets regularly to receive updated information, comment on remediation/restoration designs, and address ancillary issues not covered in the EE/CA might increase community acceptance.

IV. Additional Commentary by NECR Residents

Individual members of the NECR community have often expressed many of the comments offered above in addition to the following, all of which are supported by the Navajo Nation:

- Continuous air monitoring must be conducted during all clean-up activities and monitoring of air, water, vegetation and grounds after the reclamation for long-term protection of human health and the environment, both during and after the clean-up phase.

- Local residents should be trained, certified, and paid to observe all clean-up activities. GE/UNC should hire local individuals as clean-up workers, subject to proper training and health and safety protection. An outreach educational program on the effect of Uranium waste should be created to show the rest of the Navajo Nation what is being done at NECR and how its results will affect clean-up efforts at other waste sites in the Navajo Nation and the Grants Mineral Belt.

- Revegetation of the affected area and the mine site will not be successful unless the area receives enough water and care. A water supply sufficient to sustain vegetative growth should be installed at the site. Some community members believe that the revegetation of the Jackpile Mine at Laguna Pueblo and the Residential Time-Critical Removal Action revegetation were unsuccessful. Community members wish to be included in post-remediation care for the land.

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Thank you for the opportunity to submit these comments regarding the NECR EE/CA.

Sincerely,

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